

Attenuated *Salmonella typhimurium* SV4089 as a potential carrier of oral DNA vaccine in chickens.

ABSTRACT

Attenuated *Salmonella* has been used as a carrier for DNA vaccine. However, in vitro and in vivo studies on the bacteria following transfection of plasmid DNA were poorly studied. In this paper, eukaryotic expression plasmids encoding avian influenza virus (AIV) subtype H5N1 genes, pcDNA3.1/HA, NA, and NP, were transfected into an attenuated *Salmonella* enteric typhimurium SV4089. In vitro stability of the transfected plasmids into *Salmonella* were over 90% after 100 generations. The attenuated *Salmonella* were able to invade MCF-7 (1.2%) and MCF-10A (0.5%) human breast cancer cells. Newly hatched specific-pathogen-free (SPF) chicks were inoculated once by oral gavage with 10⁹ colony-forming unit (CFU) of the attenuated *Salmonella*. No abnormal clinical signs or deaths were recorded after inoculation. Viable bacteria were detected 3 days after inoculation by plating from spleen, liver, and cecum. Fluorescent in situ hybridization (FISH) and polymerase chain reaction (PCR) were carried out for confirmation. *Salmonella* was not detected in blood cultures although serum antibody immune responses to *Salmonella* O antiserum group D1 factor 1, 9, and 12 antigens were observed in all the inoculated chickens after 7 days up to 35 days. Our results showed that live attenuated *S. typhimurium* SV4089 harboring pcDNA3.1/HA, NA, and NP may provide a unique alternative as a carrier for DNA oral vaccine in chickens.

Keyword: Attenuated *Salmonella*; Enteric typhimurium; Oral DNA vaccine; Chickens.